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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,930	03/19/2004	Yasuhira Kondo	250750US2X	6726
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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER WANG, CLAIRE X	
			ART UNIT 2624	PAPER NUMBER
			NOTIFICATION DATE 05/07/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/803,930	<b>Applicant(s)</b> KONDO ET AL.	
	<b>Examiner</b> Claire Wang	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 12 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 9-11, 13-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because Fig. 40 contains non-English section, which needs to be translated. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

2. Claim 4 is objected to because of the following informalities:

In line 2 of claim 4, the phrase "as data" should be changed to "image data."

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 4 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Edic et al. (US 2004/0223636 hereinafter "Edic").

As to claim 1, Edic teaches an analyzer analyzing a tubular structure of an object to be examined (analysis of tomographic image data for quantification of arteries; Paragraph [0002], lines 5-8), comprising a preparing unit configured to prepare a plurality of sets of three-dimensional image data of the same object examined (CT imaging system; [0052], lines 1-3); a structure extracting unit configured to extract image data indicative of a three-dimensional tubular structure ([0173]), set by set, from the plurality of sets of three-dimensional image data, thereby a plurality of sets of structure image data being produced (Fig. 20); a reference direction specifying unit configured to specify a reference direction to the plurality of sets of three-dimensional image data (Fig. 21 illustrates the mapping of the center line to the center points in the z-direction); a reference point specifying unit configured to specify a reference point to each center line of the tubular structure contained in each of the plurality of sets of

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structure image data (Fig. 16 teaches identifying center point of masked sliced images; an example of this procedure can be seen in Fig. 21); a stretched image producing unit configured to produce, from each of the plurality of sets of structure image data, data of a stretched image of the tubular structure in each of plural sections which are mutually the same with regard to three-dimensional positions thereof and determined based on the reference direction, thereby a plurality of sets of data of stretched images being produced (Fig. 22 shows the reformatted equivalent image of Fig. 21 in the z-direction); and a stretched image displaying unit configured to display the plurality of sets of data of stretched images aligned based on the reference point (142 Fig. 1):

As to claim 4, Edic teaches a reference image producing unit configured to produce, data image of a reference image, image data as one of a volume rendering image and a maximum intensity projection (MIP) image of the three-dimensional image data (volumetric images are reformatted into one or more 2-D sliced images; [0034], lines 3-5); a reference image displaying unit configured to display the produced data of the reference image (142 Fig. 1); and an indicator displaying unit configured to display an indicator on the reference image displayed by the reference image displaying unit, the indicator indicating a direction of a section of the stretched image (Fig. 22 shows the stretched image is stretched in the z-axis direction).

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As to claim 7, wherein the indicator includes a cursor bar placed at an arbitrary position on the stretched image and two markers individually placed on both wall portions of the tubular structure in the reference image, both sidewall portions at which the two markers are individually placed being positionally corresponding to the cursor bar ([0185] lines 10-12 teaches using a cursor to designate the location of the seed pixel).

5. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edic.

As to claim 5, Edic teaches stretching of a tubular structure (Fig. 21 and Fig. 22). Edic does not expressly disclose the placement of two markings on the reference image and two corresponding markings on the stretched image. However, Examiner takes Official Notice that placing marker on images to be transformed is well known in the art. It would have been obvious at the time of the invention was made to one of ordinary skill in the art to place markers on the sliced images taught by Edic since Examiner takes official notice that in order to transform it is common to place marking on the transformation structure.

As to claim 6, Edic teaches wherein the indicator includes a further marker not only being superimposed on the reference image through the two markers on the

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reference image but also indicating a contour shape of the tubular structure (2222-2228 Fig. 22 respective oblique cuts of a vessel, which represent the outline of the contour).

As to claim 12, it is the same as claims 1 and 4-6. Therefore, it is analyzed in the same matter as claims 1 and 4-6. Where claim 1 teaches the preparing unit, the unit configured to produce data of a centerline, and the unit configured to produce data of either a stretched image or a perpendicular sectional image. Claim 4 teaches image data a producing unit and the unit configured to use the data of the reference image. Claim 5 teaches the unit configured used for specifying a position-changeable marker. Claim 6 teaches the unit configured to respond to a position change of the marker. Please see above for detail analysis.

6. Claims 2, 3 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edic in view of Yanof et al. (US 5,734,384 hereinafter "Yanof").

As to claim 2, Edic teaches wherein the stretched image-producing unit comprises a contour data extracting unit configured to extract contour data of the tubular structure from each of the plurality of sets of structure image data by using the center line as a reference (longitudinal axis curve obtained; [0229] lines 3-4), the analyzer further comprising a contour displaying unit configured to display the contour data of the plurality of sets of contour data of the tubular structure (142 Fig. 1). However Edic does not teach a change-information acquiring unit configured to acquire



information in relation to time-lapse changes of the tubular structure on the basis of the contours of a plurality of tubular structures displayed by the contour-displaying unit; and an information-displaying unit configured to display the acquired information in relation to the time-lapse changes.

Yanof teaches an apparatus of displaying images, which allows real-time adjustment of planar, or curved sections and volume reprojection view of volume data (Col. 2, lines 42-46). Thus Yanof reads on the claimed time-lapse changes based on contours and displaying said changes. Therefore, it would have been obvious for one ordinarily skilled in the art at the time the invention was made to combine Edic's image reforming procedure with Yanof's real-time adjustment of curved sections in order to make the process more user friendly (Yanof Col. 2, lines 36-41).

As to claim 3, Yanof teaches wherein the information-displaying unit is a unit displaying in a color map the acquired information in relation to the time-lapse changes (a 3-D surface that uses shading or color to provide visual clues as to the surface shape and depth; Col. 11, lines 2-5).

As to claims 14 and 15-17 they are the same as claims 3 and 5-7. Please see the above for detail analysis.

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7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Edic and Yanof as applied to claims 1-4 above, and further in view of Glenn Jr. et al. (US 2005/0245803 hereinafter "Glenn").

As to claim 8, it differs from claims 1, 2, and 4 in that claim 8 further teaches a center line correcting unit configured to be used for correcting a shape of the center line overlaid on the reference image displayed by the reference image displaying unit, which is not taught by Edic and Yanof. Glenn teaches an iterative process to determine the center line of the colon, meaning a new point is selected, which updates the center line of the tubular shape ([0081]). Thus Glenn's iterative process to determine the centerline reads on the center line-correcting unit. Therefore, it would have been obvious for one ordinarily skilled in the art at the time the invention was made to combine Edic and Yanof with Glenn because it is just one of many ways to determine the center line (Glenn [0082]).

8. Claims 9-11 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Aylward et al. (US 6,690,816) teaches a system and method for tubular object processing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Claire Wang whose telephone number is 571-270-1051. The examiner can normally be reached on Mid-day flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Claire Wang  
04/24/2007



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